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The awareness and impression of pediatric oncology and childhood cancer among health-related students at Umm Al-Qura University in Makkah city, KSA: Cross-sectional study

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ABSTRACT

Background: childhood cancer encompasses a rare high risk of mortality worldwide. Our study surveyed health students in Makkah city of western Saudi Arabia. We compared the awareness and attitude of childhood cancer and pediatric oncology and recommended strategies to bridge this awareness gap. **Methodology:** A survey-based study was conducted among health-related students at Umm Al-Qura University in Makkah, Saudi Arabia, between March 2021 and September 2021. **Results:** The number of participants in the current study was 342 students. Their mean age was 22.7 ± 1.95 years. Overall, 198 (57.9%) were males, and 144 (42.1%) were females. The majority of students were 5th-year students, with interns being the least represented. Among the colleges, the College of Medicine had the most significant percentage of students. Most students were unmarried (single). **Conclusion:** early diagnosis of childhood cancer is an essential goal in pediatric oncology; our study concluded that while most students were aware of childhood cancer, their basic information was not sufficient to allow an opportunity for early treatment and intervention while the disease burden is in its earliest and treatable stages.

Keywords: awareness, attitude, childhood cancer, pediatric oncology, health students, Saudi Arabia.

1. INTRODUCTION

Childhood cancer is a rare and complex phenomenon, with approximately 100,000 children younger than age 15 years dying from it (Al-Mutlaq et al., 2015; Ferlay et al., 2015). The causes are still unknown; however, specific

chromosomal and genetic abnormalities and environmental factors might be linked to it (Haroun et al., 2006; Al-Mutlaq et al., 2015). Nearly 7,673 children in the Arab Gulf region were affected with Childhood cancers in the period between 1998 and 2008. Approximately 8.1% of total cancer cases were during the same period (Al-Madouj et al., 2011; Al-Mutlaq et al., 2015). In contrast, Saudi Arabia Cancer Registry reported around 770 childhood cancer cases in 2008, representing 6.5% of the total number of cancer cases in the same year (Haya and Marielen, 2007; Al-Mutlaq et al., 2015).

Due to a lack of knowledge with the warning signs and symptoms of children cancer, referral to a physician for diagnosis and treatment is delayed (Latha et al., 2015). Therefore, early diagnosis of childhood cancer is an essential goal in pediatric oncology because it allows an opportunity for appropriate treatment while the disease burden is still in its early and treatable stages (Latha et al., 2015). Several studies nationally and globally (Latha et al., 2015; Geel et al., 2017) have demonstrated a fair level of awareness but the poor level of knowledge among medical students. These studies need further investigation and comparison between the health burden population for both health students and hospital residents' physicians. Consequently, this study aims to estimate the level of awareness of childhood cancer among health-related students in Umm Al-Qura University, Makkah, Saudi Arabia.

2. METHODS AND SUBJECTS

A cross-sectional study was initiated using a self-administered questionnaire at Umm Al-Qura University (UQU), Makkah, Saudi Arabia. The study was carried out from March 2021 to September 2021 after being granted ethical approval from UQU's research ethics committee (ethical number: HAPO-02-K-012-2021-09-741).

For sample size calculation, we use Epi Info™ 7.1.5 (Center for Disease Control and Prevention; Atlanta, Georgia, USA); as result, the smallest sample size that can be used to achieve an accuracy of 5% with a 95% confidence interval is 350. A multistage stratification and random sampling technique were implemented to stratify students according to gender and college. We focused on six specialty colleges at UQU: the College of Medicine, College of Applied Medical Sciences, College of Dentistry, College of Pharmacy, College of Nursing, and College of public health and health informatics. Any UQU students belonging to one of these colleges were included.

The questionnaire was categorized into three parts. We first collected the educational and demographic data of students. Then, we collected general information targeting students' attitudes regarding pediatric oncology. Lastly, we asked 16 questions to assess students' knowledge concerning childhood cancer. The questionnaire idea was driven by previously published articles. The questionnaire was sent to students between March 2021 and September 2021 after stratification into randomly chosen classes. Any inquiry about the questionnaire from participants was answered on the spot by the authors. Participants were asked to provide their consent online, and they responded to the questionnaire of their own volition.

The collected data was analyzed using appropriate statistical methods in SPSS version 23. Frequency was determined for the categorical variables and mean \pm standard deviation for the continuous variables. We used the Chi-square test to differentiate the categorical variables. P-value less or equal to 5% was considered statistically significant.

3. RESULTS

A total of 342 students of health-related students were surveyed. Table 1 shows students' educational demographic distribution; male participants (198, 57.9%) were considerably more represented than female participants. Their mean age was 22.7 ± 1.95 years; the 23- and 24-year-old age groups were predominantly represented (20.5%). In contrast, the 28- and 30-year-olds were the least represented (0.3%). All age groups are described in (Table 1). Single participants (293, 85.7%) were considerably more represented than married participants. Students at the College of Medicine were the most represented among all the colleges (270, 78.9%). Conversely, the least represented was the college of public health and health informatics (2.3%). Moreover, 5th-year students were predominant (28.1%) compared with intern students (8.5%). Regarding students' level of awareness of childhood cancer, most students were aware (172, 50.29%), while 170 (49.71%) were not aware (figure 1).

Table 1 Demographic data		
Variable	Category	Frequency (%)
Age (mean [SD])	(22.7 (1.95))	
Age	18	3(0.9%)
	19	19(5.6%)
	20	28(8.2%)
	21	43(12.6%)

	22	52(15.2%)
	23	70(20.5%)
	24	70(20.5%)
	25	36(10.5%)
	26	16(4.7%)
	27	3(0.9%)
	28	1(0.3%)
	30	1(0.3%)
Gender	Male	198(57.9%)
	Female	144(42.1%)
Academic year	2 nd year	31(9.1%)
	3 rd year	49(14.3%)
	4 th year	65(19.0%)
	5 th year	96(28.1%)
	6 th year	72(21.1%)
	intern	29(8.5%)
Collage	College of medicine	270(78.9%)
	College of applied medical sciences	25(7.3%)
	College of dentistry	21(6.1%)
	College of nursing	7(2.0%)
	College of pharmacy	11(3.2%)
	College of public health and health informatics	8(2.3%)
Marital status	Single	293(85.7%)
	Married	49(14.3%)

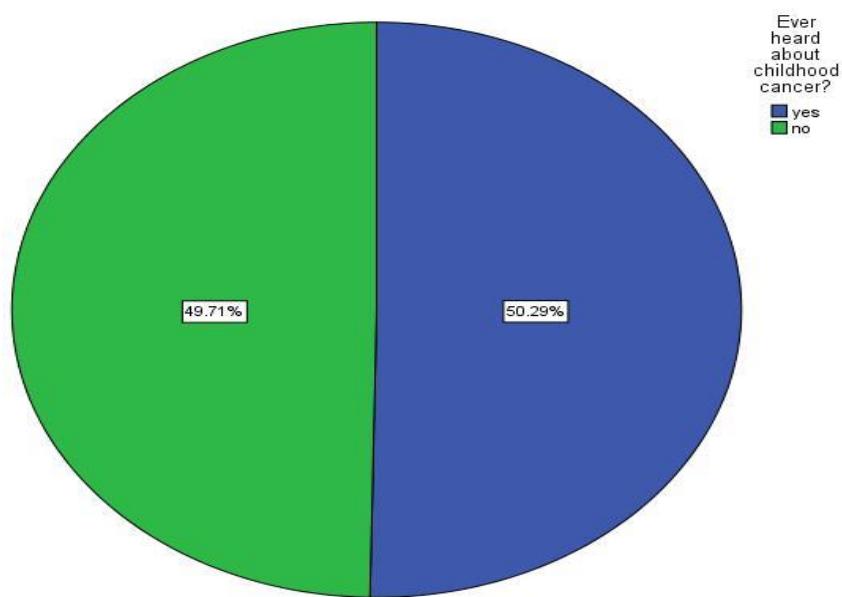


Figure 1 level of awareness of health-related students regarding pediatric cancer

Pediatric oncology attitude varied among the subgroups in association with Students' collages as described in (Table 2); there was a significant contrast when students were asked if they attended a lecture about pediatric oncology or if they believe they have sufficient information regarding pediatric oncology to detect a child suspected to have cancer during their practice if they encountered pediatric oncology patients during their clinical rotations, and if their pediatric oncology background information is enough to suspect and refer accordingly during their practice (P-values, 0.024, 0.029, 0.000, and 0.048, respectively).

Table 2 The correlation between students' attitude and their collages

Students' collages (n. 342)	Student's attitude	P-VALUE
	Have you attended any pediatric oncology patients during your curriculum?	0.168
	Have you attended a lecture class on pediatric oncology?	0.024*
	Do you have sufficient information in pediatric oncology to suspect and refer a child during their practice?	0.029*
	Do you think that there is a need to improve the teaching of pediatric oncology in your curriculum?	0.329
	Have you encountered pediatric oncology patients during your clinical postings	0.000*
	Do you have a pediatric oncology unit in your institution?	0.772
	Are you interested in pursuing pediatrics as your career after MBBS?	0.429
	Are you interested in pursuing pediatric oncology as a subspecialty?	0.118
	Do you think the information you have on pediatric oncology is enough to suspect and refer appropriately during your practice?	0.048*

Childhood cancer knowledge varied among the subgroups in association with Students' collages as described in (Table 3 & figure 2-6); there was a significant contrast when students were asked about the most common malignancy affecting children and the most common etiology that correlated with it (P-values, 0.020 and 0.001, respectively).

Table 3 The correlation between students' knowledge of childhood cancer and their collages

Students' collages (n. 342)	Students attitude	P-VALUE
	The common childhood malignancy	0.020*
	What is the percentage of childhood cancer being completely cured?	0.292
	The most common etiology of childhood malignancies?	0.001*
	Apart from tuberculosis, chronic, progressive, persistent lymphadenopathy in children should lead to a high index of suspicion for which of the following malignancy:	0.062
	The earliest manifestation of retinoblastoma in children?	0.110
	The most common modality of treatment for children with malignancies?	0.339
	A child with bimanually palpable, ballotable abdominal mass, hematuria and hypertension should be suspected to have	0.143

which factor contributed to the failure of effective treatment of childhood cancer ?

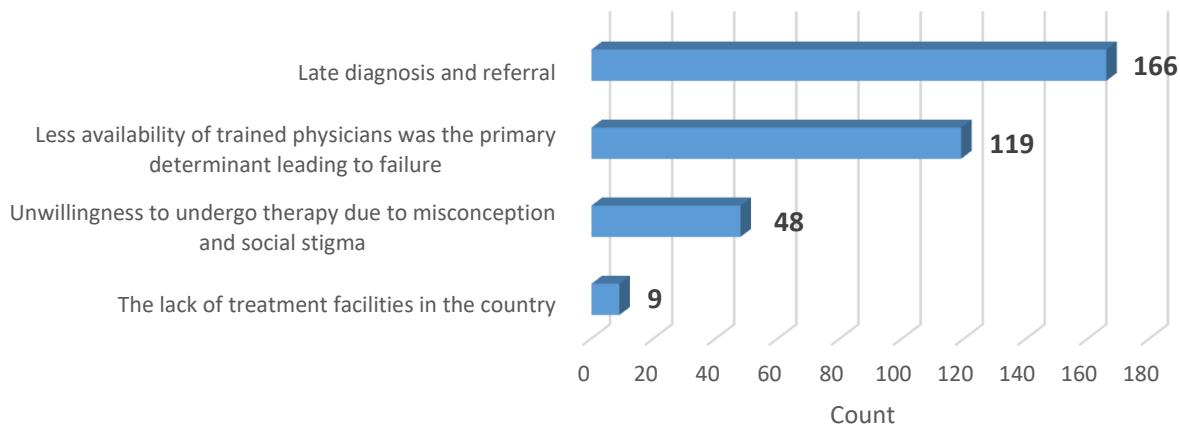


Figure 2 Most students (n. 166) linked the late diagnosis and referral to failure of effective treatment of childhood cancer.

how can we increase the awareness of childhood cancer in our society ?

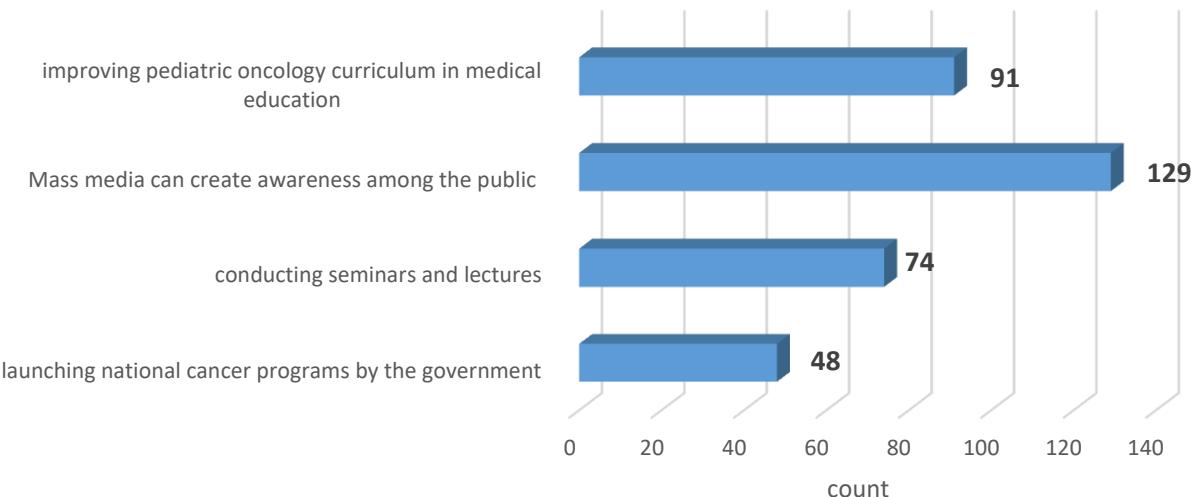


Figure 3 Shows that a jority of students believe that mass media can bring more awareness to childhood cancer (n.129).

what is the best way to support pediatric oncology patients ?

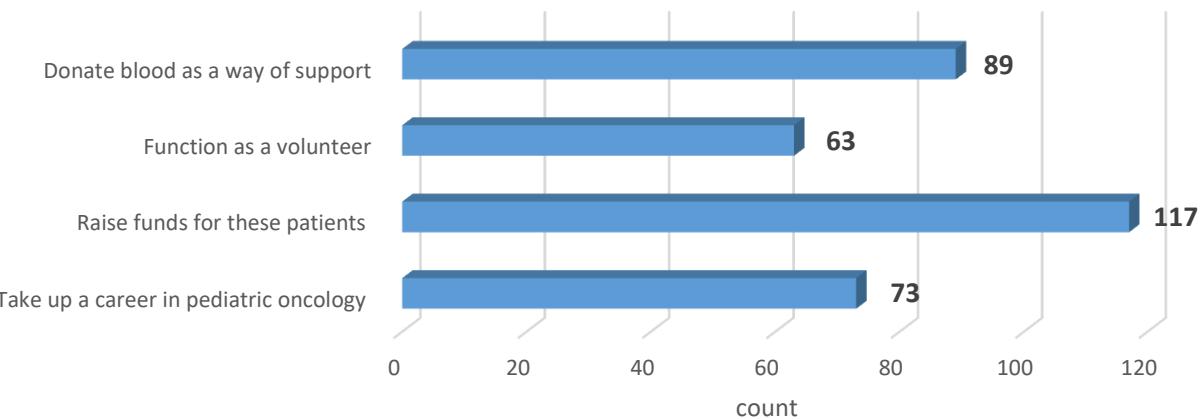


Figure 4 Shows that regarding the best way to support pediatric oncology patients, most of the students (n.117) answered raise funds for oncology patients while (n.63) believe that functioning as a volunteer is the best way to support pediatric oncology patients.

In your opinion, what are the factors that lead to neglecting this speciality ?

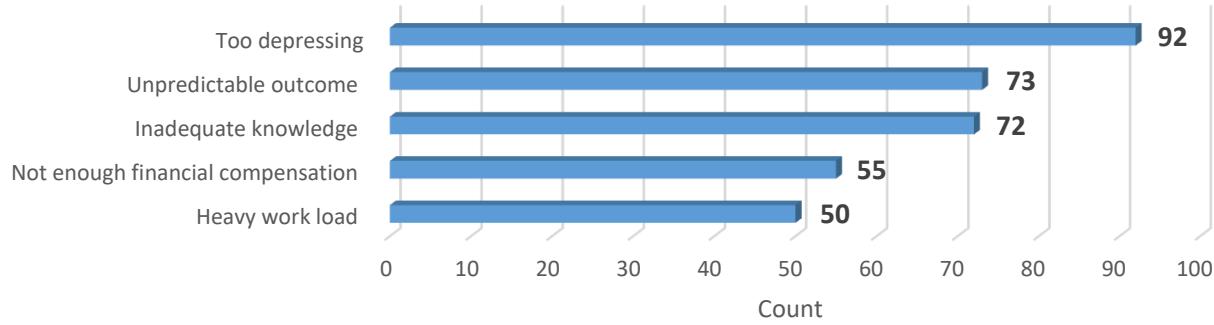


Figure 5 Shows that most students (n.92); believe that depression is a factor that leads to neglecting pediatric oncology specialty. However, a close number of students answered that unpredictable outcomes and inadequate knowledge lead to neglecting pediatric oncology specialty [(n.73), (n.72), respectively].

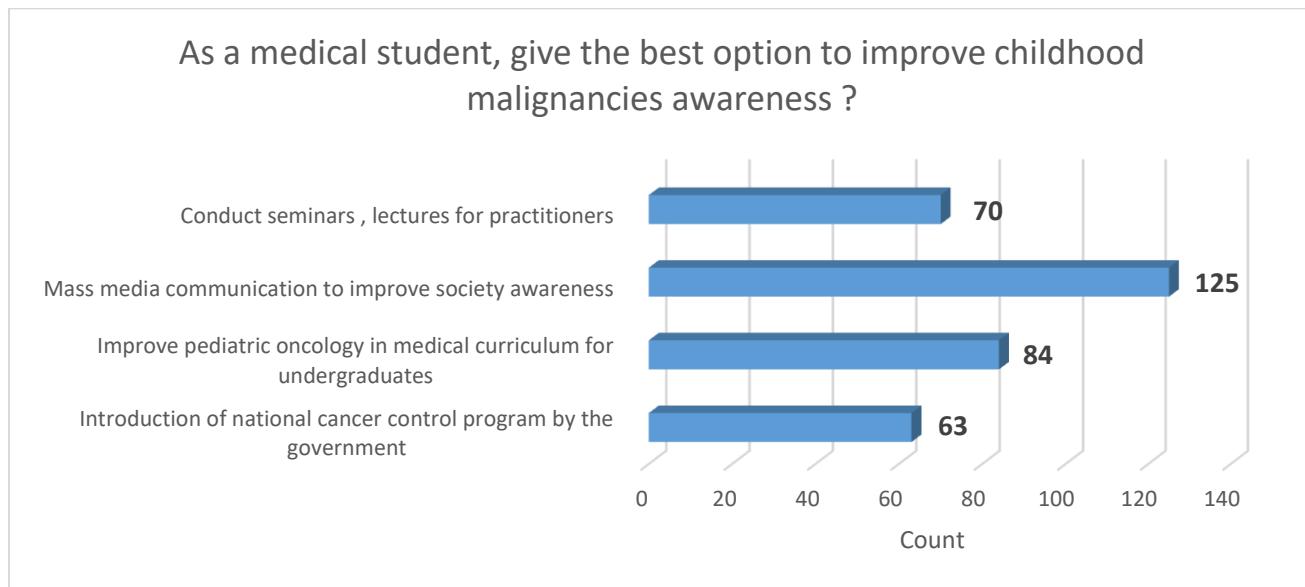


Figure 6 Shows that the best option to raise awareness concerning childhood malignancies most of the students answered that mass media communication was the best option (n.125).

4. DISCUSSION

This survey review of health-related students in Makkah suggested that the level of awareness about childhood cancer is reasonable but can be improved. Furthermore, students' attitudes toward pediatric oncologies are reasonably positive. In the present study, more than half of the participants were male. This disagrees with many studies in which female participants are predominant (Latha et al., 2015; Geel et al., 2017; Alodhaydan et al., 2019).

Our study demonstrates a significant difference between childhood cancer knowledge and students' collage regarding the common malignancy and the etiology affecting childhood (P-values, 0.020 and 0.001, respectively). However, the rest basic childhood cancer questions were not significant. A survey-based study among medical students in South India concluded that (70%) of participants correctly answered the basic childhood cancer questions. State-run primary and secondary healthcare facilities may be the first place where a cancer-stricken youngster meets healthcare experts, particularly junior doctors, who can detect early warning symptoms. Delays in diagnosis are nearly always the result of a lack of familiarity with these warning signs and symptoms (Workman et al., 2007; Geel et al., 2017). Early detection allows for prompt treatment and may help to avoid possible complications (Raney et al., 1994; Geel et al., 2017).

Over the last two decades, the importance of educating the healthcare community on detecting warning signs and symptoms has been recognized (Chantada et al., 1999; Geel et al., 2017). It was decided that a broader spectrum of medical practitioners should be taught and that pediatric oncologists should not be the only ones who are aware of early warning signals of childhood cancer (Wilne et al., 2010; Stefan and Siemonsma, 2011; Geel et al., 2017). Given that physician-related delays are typically greater than patient-related delays, and since more than half of patients are initially misdiagnosed, there is a strong need to raise awareness in South Africa (Stefan and Siemonsma, 2011; Geel et al., 2017). When a child's presenting symptom is only pain, there is a much longer overall delay, including physician-related delay (Workman et al., 2007; Geel et al., 2017). Furthermore, the recent study indicates that painful joints and bones are underappreciated, implying that they may be overlooked in therapeutic settings. More attention on juvenile neurological tumors, with more patient exposure in university hospitals during undergraduate training, should be used to overcome poor knowledge of neurological signs (Geel et al., 2017).

According to research in India, about half of the interviewees did not attend enough pediatric oncology lectures (Latha et al., 2015). The lack of positions in pediatric oncology has led to a lack of knowledge and preparedness to diagnose childhood cancers early. As shown in this study, the current curriculum structure does not allow any contact with cancer patients during the study period (Latha et al., 2015). However, our study represents a significant correlation between attending enough pediatric oncology lectures and students' collages. Most students (n. 166) link the late diagnosis and referral to failure of effective treatment of childhood cancer conversely. This is consistent with an Indian study (Geel et al., 2017) where 200 (40%) contributed to the same reasons. However, the majority of students (n.92); believe that depression is a possible factor that leads to neglecting the pediatric

oncology specialty. This, on the other hand, disagrees with the Indian study where 120 (24%) of participants contributed to the same reasons.

A possible limitation in this study is inadequate sample size. Furthermore, this study is not illustrative among universities in Saudi Arabia.

5. CONCLUSION

Childhood cancer is a serious condition that needs early detection and intervention, and the ability to catch early warning signs can lead to a decrease in mortality rates among childhood cancer patients. Our study concludes that the majority of students were aware of childhood cancer while their knowledge about basic childhood cancer information was not. Further investigations are required to estimate the knowledge scores of university students.

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Authors Contributions

Salah Bakry:	Concept – design – literature search – manuscript writing and review – guarantor.
Hammad Alharbi:	statistical analysis – manuscript editing and review – literature search.
Abdulrahman Kabli:	Manuscript editing and review – literature search – data analysis.
Abdullah Allehyani:	Manuscript editing and review – literature search – concept and design.
Ammar Aljohani:	Manuscript editing and review – literature search.
Abdelelah Mofti:	Manuscript editing and review – literature search
Ahmad Mofti:	Manuscript editing and review – literature search – General supervision.

Ethical approval

The study was approved by the Medical Ethics Committee of Umm Al-Qura University (ethical approval code: HAPO-02-K-012-2021-09-741).

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Conflict of Interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are presented in the paper.

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